

CLAIMS

What is claimed is:

1. A biopsy assembly (20) for insertion into a mass of bone (44) to collect a biopsy specimen (74) of tissue therefrom, comprising:
 - 5 a cannula handle (22) having a passageway (24) extending therethrough from a support end (26) to a receiving end (28) defining a recess (30) disposed about said passageway (24);
an access cannula (34) having a proximal end (36) supported in said passageway (24) and extending therefrom to an open end (38);
10 an introduction stylet (40) for selective insertion into said passageway (24) and through said access cannula (34) for advancing said access cannula (34) into the mass of bone (44) to establish a biopsy harvest site (46);
a cap (42) supporting said stylet (40); and
an inner cannula (66) for selective insertion through said passageway
15 (24) into said access cannula (34) and extending from a proximal end (68) to a distal end (70);
said inner cannula (66) including a swaged portion (72) extending from said distal end (70) for retaining a biopsy specimen (74) therein and having a non-deformable sidewall (76) with a frustoconical interior surface (78) extending radially
20 inwardly at a predetermined angle from said distal end (70) to a biopsy opening (80) for receiving the biopsy specimen (74) therethrough.

2. A biopsy assembly (20) as set forth in claim 1 wherein said sidewall (76) includes an exterior surface (82) and said biopsy opening (80) includes an annular cutting edge (84) having a pair of beveled facets (86) extending between said exterior surface (82) and said edge (84) for rendering said edge (84) sharp.

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3. A biopsy assembly (20) as set forth in claim 2 wherein said facets (86) converge at said cutting edge (84) to define a pair of opposed cusps (88) extending therefrom.

10 4. A biopsy assembly (20) as set forth in claim 1 wherein said predetermined angle comprises 2°.

15 5. A biopsy assembly (20) as set forth in claim 2 wherein said exterior surface (82) extends radially inwardly at a predetermined angle from said distal end to said cutting edge (84).

6. A biopsy assembly (20) as set forth in claim 5 wherein said predetermined angle of said exterior surface (82) comprises 2°.

20 7. A biopsy assembly (20) as set forth in claim 1 and including a tool handle (94) connected to said proximal end (68) of said inner cannula (66).

8. A biopsy assembly as set forth in claim 7 wherein said tool handle (94) includes a luer connector (98) surrounding said inner cannula (66).

9. A biopsy assembly (20) as set forth in claim 8 and including a syringe (100) for connection to said luer connector of said tool handle (94) for applying a vacuum to said inner cannula (66) for retaining the biopsy specimen (74) within said swaged portion (72).

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10. A biopsy assembly (20) as set forth in claim 1 wherein said cannula handle (22) includes male luer threads (32) disposed in said recess (20) about said receiving end (28).

10 11. A biopsy assembly (20) as set forth in claim 10 wherein said cap (42) includes opposed fingers (48) for selectively engaging said male luer threads (32) upon rotation of said cap (42) relative to said handle (22).

12. A biopsy assembly (20) as set forth in claim 1 wherein said cannula
15 handle (22) and said cap (42) present a tongue and groove connection (50) for engaging upon rotation of said cap (42) relative to said handle (22).

13. A biopsy assembly (20) as set forth in claim 12 wherein said tongue
and groove connection (50) includes a plurality of grooves (52) extending radially
20 into said cannula handle (22) in said recess (30) and a plurality of tongues (54)
extending radially from said cap (42) for engaging said grooves (52) upon rotation of
said cap (42) relative to said handle (22).

14. A biopsy assembly (20) as set forth in claim 13 wherein said tool handle (94) includes tongues (96) for insertion into said grooves (52) in said cannula handle (22) upon insertion of said inner cannula (66) through said access cannula (34).

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15. A biopsy assembly (20) as set forth in claim 1 and including an obturator (102) for selective insertion through said inner cannula (66) to remove the biopsy specimen (74) therefrom.

10 16. A biopsy assembly (20) for insertion into a mass of bone (44) to harvest a biopsy specimen (74) of tissue therefrom, said assembly (20) comprising;
a cannula handle (22) having a passageway (24) extending therethrough from a support end (26) to a receiving end (28) defining a recess (30) disposed about said passageway (24) and including male luer threads (32) disposed in said recess (30)
15 about said passageway (24);

an access cannula (34) supported in said passageway (24) and extending from said cannula handle (22) to an open end (38);

an introduction stylet (40) for selective insertion into said passageway (24) and through said access cannula (34) for closing said open end (38) thereof and
20 for advancing said access cannula (34) into the mass of bone (44) to establish a biopsy harvest site (46);

a cap (42) supporting said stylet (40) and including opposed fingers (48) for engaging said male luer threads (32);

said cannula handle (22) and said cap (42) presenting a tongue and

groove connection (50) for engaging upon rotation of said cap (42) relative to said handle (22) and including a plurality of grooves (52) extending radially into said cannula handle (22) in said recess (30) and a plurality of tongues (54) extending radially from said cap (42) for engaging said grooves (52) upon rotation of said cap (42) relative to said cannula handle (22);

an inner cannula (66) for selective insertion through said passageway (24) into said access cannula (34) and extending from a proximal end (68) to a distal end (70);

said inner cannula (66) including a swaged portion (72) extending from said distal end (70) for retaining a biopsy specimen (74) therein and having a non-deformable sidewall (76) including an exterior surface (82) and an interior surface (78) extending radially inwardly at a predetermined angle from said distal end (70) to a biopsy opening (80) having an annular cutting edge (84) and a pair of beveled facets (86) extending from said exterior surface (82) and converging at said cutting edge (84) to define a pair of opposed cusps (88) extending therefrom;

a tool handle (94) connected to said proximal end (68) of said inner cannula (66) and including tongues (96) for insertion into said grooves (52) in said cannula handle (22) upon insertion of said inner cannula (66) through said distal end (70) of said access cannula and having a luer connector (98) disposed about said proximal end (68);

a syringe (100) for selective connection to said luer connector (98) of said tool handle (94) for applying a vacuum to said inner cannula (66) for retaining the biopsy specimen (74) within said swaged portion (72); and

an obturator (102) for insertion through said inner cannula (66) to

remove the biopsy specimen (74) therefrom.

17. A method of collecting a biopsy specimen of tissue (74) from a bone (44), comprising the steps of;

5 inserting an introduction stylet (40) through an access cannula (34) to close an open end (38) of the access cannula (34),

inserting the stylet (40) and access cannula (34) into a bone (44) to establish a harvest site (46) therein,

removing the introduction stylet (40) from the access cannula (34)
10 whereby the access cannula (34) maintains an access pathway to the harvest site (46);
providing an inner cannula (66) extending from a proximal end (68) to a distal end (70);

swaging a portion (72) of the inner cannula (66) to form a non-deformable sidewall (76) having an exterior surface (82) and a frustoconical interior
15 surface (79) extending radially inwardly at a predetermined angle from the distal end (70) to converge at a continuous annular cutting edge (84) defining a biopsy opening (80);

inserting the inner cannula (66) into the access cannula (34) and extending the cutting edge (78) through the open end (38),

20 advancing the access and inner cannulas (34), (66) a predetermined distance into the bone (44) whereby the cutting edge (84) severs a specimen (34) from the bone (44) and urges the specimen (74) through the biopsy opening (80) into the inner cannula (66),

removing the inner cannula (66) from the bone (44), and

removing the specimen (74) from the inner cannula (66).

18. A method as set forth in claim 17 further defined as forming a pair of beveled facets (86) on the sidewall (76) of the inner cannula (66) extending between the exterior surface (82) and the cutting edge (84) for rendering the cutting edge (84) sharp.

19. A method as set forth in claim 18 further defined as converging the facets (86) at the cutting edge (84) to define a pair of opposed cusps (88).

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20. A method as set forth in claim 17 further defined as connecting a tool handle (94) to the proximal end (68) of the inner cannula (66).

21. A method as set forth in claim 20 further defined as forming a plurality of tongues (96) extending from the tool handle (94).

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22. A method as set forth in claim 21 further defined as inserting the inner cannula (66) through a passageway (24) of a cannula handle (22) carried by the access cannula (34).

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23. A method as set forth in claim 22 further defined as rotating the tool handle (94) relative to the cannula handle (22) to engage the tongues (96) with complementary grooves (52) in the cannula handle (22) to thereby retain the inner cannula (66) within the access cannula (39).

24. A method as set forth in claim 23 further defined as connecting a syringe (100) to a luer connector (98) of the tool handle (94) and applying a vacuum to the inner cannula (66) for retaining the biopsy specimen (74) in the inner cannula (66).